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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/668,850	09/22/2003	Yinghuai Zhu	033946-0301	4962
30542	7590	04/15/2005	EXAMINER	
FOLEY & LARDNER P.O. BOX 80278 SAN DIEGO, CA 92138-0278			LU, C CAIXIA	
			ART UNIT	PAPER NUMBER

1713

DATE MAILED: 04/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/668,850

Applicant(s)

ZHU, YINGHUI

Examiner

Caixia Lu

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) 17-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-26 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/4/04
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-16, drawn to a catalyst, classified in class 556, subclass 8.
  - II. Claims 17-20, drawn to a process of making catalyst, classified in class 502, subclass 202.
  - III. Claims 21-26, drawn to a polymerization process, classified in class 526, subclass 134.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product can be made by a different process when the heteroatom of heteroatom anion is oxygen.
3. Inventions I and III are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the catalyst can be used in a materially different process such as hydrogenation.

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4. Inventions II and III are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions are two different processes for making polymer and catalyst respectively.

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

6. Because these inventions are distinct for the reasons given above and the search required for one of the groups is not required for the rest of the groups, restriction for examination purposes as indicated is proper.

7. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

8. During a telephone conversation with Attorney Barry Wilson on April 11, 2005 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-16. Affirmation of this election must be made by applicant in replying to this Office action. Claims 17-20 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

9. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim

remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Claim Rejections - 35 USC § 112***

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1

(i) The term "preferably" should be avoided in the claims because it is not clear whether the term which "preferably" pertains is required or optional.

(ii) The limitation of "a hydrocarbyl bridge comprising at least two carbon atoms, wherein at least one bridging carbon atom may be replaced by Si" is somewhat illogical-when one of the carbon is replaced with Si, the "hydrocarbyl bridge comprising at least two carbon atoms" limitation may not be met.

(iii) The other end of the hetero anion terminated "bridge" is not defined.

(iv) The term of "valence group" is not recognized in the art. This term is used throughout of the claims, clarification is requested.

Claims 2 and 15

The term "o-alkyl" in both claims respectively is not recognized in the art.

Claim 9

The selective format of "selected from the group consisting of ...or" is improper. The Markush terminology requires the phrase "selected from the group consisting of" and the connector "and" between the last two members. See MPEP 2173.05 (h).

Claim 13

Line 4, the first term "and" should be deleted.

Claim 15

On page 24, (i) line 3, the term "n" is not defined. (ii) line 4, the article "a" in "a bridge" should be replaced with --the--.

***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 1-4 and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al. (Inorganic Chemistry Communications, vol. 4 (2001), pages 486-489) in view of Hlatky et al. (US 6,245,706).

Scheme 1 of page 488 demonstrates the preparation of metallacarborane complexes of zirconium (3) and titanium (4). It is noted that the "CH<sub>2</sub>" group bridging the NH and the carborane does not comprising at least two carbon atoms. However, bridging group of (CH<sub>2</sub>)<sub>x</sub> wherein x is 2 or 3 are shown in Fig. 1 on page 488. Therefore, it would have been obvious at the time of the invention to prepared metallacarborane complexes which are homologue of metallacarborane complexes of

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zirconium (3) and titanium (4) by replacing the  $\text{CH}_2$  bridging group with  $(\text{CH}_2)_x$  wherein  $x$  is 2 or 3 in order to prepare a catalyst complex with varied steric selectivities and in the absence any showing of criticality and unexpected results.

It is also noted that Zhu does not expressly teach the Zr or Ti in the metallocarborane complexes being bonded to a weak or non-coordinating anion. Converting an anion such as chloride bonded to the metal in the catalyst complex to a weak or non-coordinating anion such as a borate anion is a common practice in order to increase the activity of the organometallic complex, and such is taught in Hlatky (col. 11, lines 3-25). Therefore, it would have been obvious at the time of the invention to react Zhu catalyst complex with Hlatky's borate cocatalyst to convert the chloride to a borate in the complex in order to provide a complex catalyst with improved catalytic activities and in the absence any showing of criticality and unexpected results.

***Allowable Subject Matter***

14. Claims 5-9 and 15 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

15. Claim 16 is allowed.

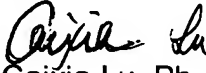
The cited prior art does not teach or reasonably suggest the  $\text{R}^1$  group of carborane to be link to a support of claims 5-9, the bridge  $\text{R}^2$  of to contain a chiral center of claim 15 or to be a cyclohexyl ring. Thus, the subject matter of instant claims is deemed to be novel.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caixia Lu whose telephone number is (571) 272-1106. The examiner can normally be reached from 9:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful and the matter is urgent, the examiner's supervisor, David Wu, can be reached at (571) 272-1114. The fax numbers for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1700.

  
Caixia Lu, Ph. D.  
Primary Examiner  
April 11, 2005